

REMARKS

35 USC §112

The Examiner rejects claims 1-7 and 18 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Applicant respectfully disagrees.

First, the Applicant has moved the provision in question into a separate dependent claim – claim 21. Second, the claim is actually quite clear with respect to the materials and the achievable goal. The specification of the application spends a great deal of time walking the reader through interfacial thermal resistance and how to minimize or lower it. The Applicants consider conventional thermal interface materials to have a certain interfacial thermal resistance. The materials developed and disclosed, for example in claim 1, are designed to lower the thermal interface resistance over these conventional materials. The term “lower” or “minimize” is not meant to imply “the lowest possible interfacial thermal resistance humanly possible”, but is instead meant to include lowering it over conventional materials.

The Applicant respectfully requests that the Examiner review claim 21 and reconsider the rejection. Obviously, the rejection regarding claims 1-7 and 18 is now moot.

35 USC §102

Claims 1-3, 5, 7 and 18 are rejected under 35 USC §102(b) as being anticipated by Nguyen et al. (US 6238596). The Applicant respectfully disagrees.

Amended claim 1 recites as follows:

“A layered thermal component, comprising:

at least one thermal interface component, wherein the thermal interface component comprises at least one rubber-resin modified paraffin polymer wax system and at least one thermally conductive filler material; and

at least one heat spreader component coupled to the thermal interface component.”
(emphasis added)

The Nguyen reference, which is commonly-owned and assigned to Honeywell International Inc. along with the present application, discloses compliant and crosslinkable thermal interface materials and states that they can be pre-applied to heat sinks. The Nguyen reference however does not disclose the formation or use of rubber-resin-wax systems, such as that disclosed in claim 1 and the specification; and therefore Nguyen does not teach all of the claimed elements of the present application. “Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration.” *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention “arranged as in the claim”. *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Claim 1 is therefore allowable as not being anticipated

by Nguyen. Further, Nguyen does not anticipate claims 2-3, 5, 7 and 18 of the present application by virtue of their dependency on claim 1.

Claims 1-5, 7 and 18 are rejected under 35 USC §102(b) as being anticipated by Pate et al. (US 4584336). The Applicant respectfully disagrees.

Amended claim 1 recites as follows:

“A layered thermal component, comprising:
at least one thermal interface component, wherein the thermal interface component comprises at least one rubber-resin modified paraffin polymer wax system and at least one thermally conductive filler material; and
at least one heat spreader component coupled to the thermal interface component.”
(emphasis added)

Pate discloses thermally conductive one-component room temperature vulcanizable organopolysiloxane compositions, but there is no appreciation of strategically minimizing interfacial thermal resistance in selection of the thermal interface material with the heat sink. The Pate reference however does not disclose the formation or use of rubber-resin-wax systems, such as that disclosed in claim 1 and the specification; and therefore Pate does not teach all of the claimed elements of the present application. “Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration.” *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention “arranged as in the claim”. *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221

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USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Claim 1 is therefore allowable as not being anticipated by Pate. Further, Pate does not anticipate claims 2-5, 7 and 18 of the present application by virtue of their dependency on claim 1.

35 USC §103

Claims 1-3, 5-7 and 18 are rejected under 35 USC §103(a) as being unpatentable over Bartley et al (US 6084775) in view of Nguyen et al. (US 6238596). The Applicant respectfully disagrees.

Amended claim 1 recites as follows:

“A layered thermal component, comprising:

at least one thermal interface component, wherein the thermal interface component comprises at least one rubber-resin modified paraffin polymer wax system and at least one thermally conductive filler material; and

at least one heat spreader component coupled to the thermal interface component.”
(emphasis added)

Bartley teaches aluminum heatsinks that are platable with a solderable layer and overplated with a solder release layer. The release layer comprises a tin-lead-indium alloy. In addition, a mechanically compliant, thermally conductive adhesive is used to join the heat sink to the module. Bartley does not teach, disclose or suggest the formation or use of rubber-resin-wax systems, such as those disclosed in the present application and in claim 1.

Nguyen, which is commonly-owned and assigned to Honeywell International Inc. along with the present application, discloses compliant and crosslinkable thermal interface materials and states that they can be pre-applied to heat sinks, but there is no disclosure or suggestion of the use of rubber-resin-wax systems, such as those disclosed in the present application, and therefore, Nguyen does not cure the obvious deficiencies of the Bartley reference.

Claim 1 is therefore allowable as not being obvious in view of Bartley alone or in

combination with Nguyen. Further, claims 2-3, 5-7 and 18 of the present application are not obvious in view of the combination of Bartley and Nguyen by virtue of their dependency on claim 1.

Claims 1-7 and 18 are rejected under 35 USC §103(a) as being unpatentable over Bartley et al (US 6084775) in view of Pate et al. The Applicant respectfully disagrees.

Amended claim 1 recites as follows:

“A layered thermal component, comprising:

at least one thermal interface component, wherein the thermal interface component comprises at least one rubber-resin modified paraffin polymer wax system and at least one thermally conductive filler material; and

at least one heat spreader component coupled to the thermal interface component.”
(emphasis added)

Bartley teaches aluminum heatsinks that are platable with a solderable layer and overplated with a solder release layer. The release layer comprises a tin-lead-indium alloy. In addition, a mechanically compliant, thermally conductive adhesive is used to join the heat sink to the module. Bartley does not teach, disclose or suggest the formation or use of rubber-resin-wax systems, such as those disclosed in the present application and in claim 1.

Pate discloses thermally conductive one-component room temperature vulcanizable organopolysiloxane compositions, but there is no appreciation of strategically minimizing interfacial thermal resistance in selection of the thermal interface material with the heat sink.

The combination of Bartley with Pate does not cure the deficiencies of Bartley such

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that the combination renders claim 1 of the present application unpatentable. Claim 1 is therefore allowable as not being anticipated by Pate. Further, Pate does not anticipate claims 2-3, 5-7 and 18 of the present application by virtue of their dependency on claim 1.

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REQUEST FOR A TELECONFERENCE

The undersigned Attorney-of-Record requests a teleconference to discuss this case, if the current amendments do not place it in condition for allowance. Dr. Thompson is available generally Monday-Thursday from 8AM to 6PM PDT and can be reached at 949-224-6282.

REQUEST FOR ALLOWANCE

Claims 1-7, 18 and 21 are pending in this application, and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Respectfully submitted,
Buchalter Nemer, A Professional Corp.



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